extensive burials at that prehistoric city, for, burials are always psychologically revealing and give us, moderns an inkling into the faiths and beliefs of the dim distant past. Fortunately Mr. Vats discovered an extensive cemetery at Harappa with burials belonging to two distinct types, the earlier ones being what he has termed "earth burials" and the later ones "pot burials". In the mythological scenes painted on the burial jars, Mr. Vats finds many items of Indian beliefs, echoes of which are heard in the Vedas.

A. A.

LORD RUTHERFORD

Rutherford, being the Life and Letters of Lord Rutherford, O.M. By A. S. Eve, with a Foreword by Earl Baldwin of Bewdley. (Cambridge University Press, London), 1939. Pp. 451. Price 21*sh*.

THE Cavendish Professorship of experimental physics at Cambridge was occupied in succession by four outstanding men of genius and worldwide fame, namely, Clerk-Maxwell, Rayleigh, J. J. Thomson and Rutherford, whose work made an uneffaceable impression on science. Clerk-Maxwell was the first incumbent of the chair from 1871 to 1879, but his principal contributions to science were made at an earlier period. Rayleigh who succeeded him resigned in 1884 after a brief tenure of five years. He was succeeded by J. J. Thomson, then a young man only twenty-eight years of age. Both Clerk-Maxwell and Rayleigh were essentially individualists. The fame of the Cavendish Laboratory as a great centre of experimental research really dates from the year 1894 when J. J. Thomson turned his attention to the study of the discharge of electricity in gases. About this time, the University instituted a research degree open to any one who resided for two years and did an original investigation which received the approval of the examiners. The first research student to work under J. J. Thomson under this scheme was a young man from New Zealand who came to England with an 1851 Exhibition scholarship. That young student was Ernest Rutherford, who fittingly enough, succeeded J. J. Thomson twenty-four years later when the latter retired from the Cavendish Professorship in 1919. J. J. Thomson received the Nobel Prize for Physics in 1906, and Rutherford, the Nobel Prize for Chemistry in 1908. Their mortal remains now rest side by side at the Westminster Abbey in London where Britain's greatest men lie buried.

The fascinating story of Rutherford's remarkable life and career is well told in the biography which has been published by the Cambridge University Press. The book has been compiled by a friend and fellow-physicist in the person of Prof. A. S. Eve, F.R.S., who had been associated with Rutherford in the days of his earliest scientific triumphs at the McGill University in Canada and continued in close touch with him till the end. Much of the most interesting part of the book consists of extracts from the letters written by Rutherford himself to his wife and to his numerous friends and collaborators over a period of forty years. The care of Lady Rutherford in having preserved her husband's letters was indeed most fortunate, as they reveal Rutherford's personality in a remarkable way and tell the story of his life far more intimately and vividly than any biographer could have done.

The writer of this review well remembers his meeting Rutherford at the Cavendish Laboratory on the occasion of his first visit to England in 1921, and again on various occasions in 1924 and in 1929. He takes the opportunity of referring with pleasure and gratitude to the generous and friendly spirit manifested by Rutherford in his contacts with the writer. Many of Rutherford's letters to his friends were in his well-known and characteristic handwriting. It was the magnificent personality of Rutherford and his readiness to help the cause of science in every way, quite as much as the greatness of his own scientific work, which evoked the enthusiastic admiration of his colleagues and made him the towering figure he was in the world of science. The story of Rutherford's life and career cannot fail to be an inspiration to all students of science. The volume under review is one which may be heartily commended to every one who is interested in the triumphs of the human spirit in the world of Knowledge.

C. V. RAMAN.

CENTENARIES

Bugge, Thomas (1740-1815)

THOMAS BUGGE, a Danish astronomer, was born at Copenhagon, October 12, 1740. After a course in theology, he devoted himself to mathematics, astronomy, physics and mensuration. In 1761 he made observations on the transit of Venus. In 1777 he became professor of astronomy in the University of his native town. Next year he took charge of the observatory of the Round Tower. In 1798 he was deputed to work with the National Institute of Paris for securing uniformity of measures and weights.

The extreme accuracy of the excellent charts of Denmark, published by the Academy of Sciences, is mainly owing to him. His work on the coastal survey had considerable value. By his careful indication of every coast, harbour, island, rock and sand bank, the navigation of the Danish waters was made quite safe.

Bugge wrote more than a dozen papers of astronomical and geographical importance. The first of these was *Beskriveise over den Opmanlingsmethode som bruges ved de denske geographiske korter* (1779). The most used books of his are *De forste Grunde til den suhaeriske og theorestiske Astronomie, sand der mathematiske geographie* (1796) and *De forste Grunde til den rene ciller abstracte Mathematic* 3 D1. 1813–14.

Bugge died January 15, 1815.

Vigors, Nicholas Aylward (1785-1840)

NICHOLAS AYLWARD VIGORS, a British ornithologist, was born at Old Leighin in 1785. While he was at the Trinity College, Oxford, he wrote his *Enquiry into the nature and extent of poetick licence* which was published in 1810. After seeing military service in the Peninsular War, he qualified himself for the M.A. Degree in 1918. He was also created D.C.L. in 1832.

From early age Vigors had been forming extensive collections of birds and insects and these he presented to the Zoological Society which he helped in founding in 1826. He was the first secretary of the Society and held the office till 1833. His famous paper *On the natural affinities that connect the orders and families of birds* was published in 1819 in the *Transactions* of the Linnean Society. Between 1825 and 1836 he wrote some forty papers on ornithology. He assisted Sir William Jardine and Prideaux John Selby in their *Illustrations of ornithology* (1825–39) and wrote the section *Ornithology* for the *Zoology of Captain Beechy's voyage* (1839). He was also for some time joint editor of the *Zoological journal* (1828–35).

After sitting in Parliament for about eight years, as an advanced liberal, Vigors died at his house in Chester Terrace, Regent's Park, London, October 26, 1840.

Kohlrausch, Friedrich Wilhelm (1840-1910)

FRIEDRICH WILHELM KOHLRAUSCH, a German physicist, was born at Rinstein, October 14, 1840. Having studied at Gottingen and Erlangen, he became a professor of his University in 1866. After seeing some other appointments he became professor of physics in the University of Wurburg in 1875 and of Strassburg in 1888.

Physics was in the family so to speak. Kohlrausch's father was himself a physicist of great distinction. In conjunction with Weber he carried out for the first time a determination of the ratio of the electromagnetic to the electrostatic unit of electrical quantity and thus laid the foundation for the absolute system of electrical measurements. The son also specialised in the same subject. He also did much original work on the conductivity of solutions.

Kohlrausch wrote many papers and he is best known among students for his justly famous *Leitfaden der praktischen Physik* (1870) which was the first and also pronounced to be the best of its kind. It reached the eighth German edition in 1896 and went through two editions in English.

Kohlrausch died at Merburg, February 1910.

S. R. RANGANATHAN.

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